

连续可变量喷雾系统响应特性试验 Experiment on Response Characteristics of Variable-rate Continuous Spraying System

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摘要: 构建了以电动调节阀为变流器件的变量喷雾系统, 并采用试验方法得出了系统的阶跃响应特性, 试验结果表明: 在阶跃幅值 $\Delta Q$  分别为0.4、1.4、3.4、3.9、4.4 L/min条件下, 系统上升时间的最大值为1 s, 表明系统响应速度与现有的调压变量喷雾系统相当; 系统上升时间、峰值时间和超调量都有幅值相关性, 说明系统是非线性系统。因此对此类调流变量喷雾系统, 其控制设计必须考虑非线性问题。 In order to develop a new type of precision spraying equipment, a set of variable-rate spray system based on electric control valve device as a converter was developed, and the step response characteristics of the system were studied by using experimental methods. The result shows that the maximum rise time is 1 s in the condition of step amplitude  $\Delta Q = 0.4, 1.4, 3.4, 3.9, 4.4$  L/min, which is comparable with variable-rate spray system controlled by changing flow press; the rise time, peak time and overshoot show correlation with the amplitude, which indicates that the system belongs to nonlinear system. So the control design of this type of variable-rate continuous spray system must take nonlinear problems into account.

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